

## **Chapter Resources**

# **Interactions of Life**

### **Includes:**

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#### **Reproducible Student Pages**

##### **ASSESSMENT**

- ✓ Chapter Tests
- ✓ Chapter Review

##### **HANDS-ON ACTIVITIES**

- ✓ Lab Worksheets for each Student Edition Activity
- ✓ Laboratory Activities
- ✓ Foldables—Reading and Study Skills activity sheet

##### **MEETING INDIVIDUAL NEEDS**

- ✓ Directed Reading for Content Mastery
- ✓ Directed Reading for Content Mastery in Spanish
- ✓ Reinforcement
- ✓ Enrichment
- ✓ Note-taking Worksheets

##### **TRANSPARENCY ACTIVITIES**

- ✓ Section Focus Transparency Activities
- ✓ Teaching Transparency Activity
- ✓ Assessment Transparency Activity

#### **Teacher Support and Planning**

- ✓ Content Outline for Teaching
- ✓ Spanish Resources
- ✓ Teacher Guide and Answers



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# Reproducible Student Pages

## Reproducible Student Pages

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# Hands-On Activities



## Observing Seedling Competition

### Procedure

1. Fill **two plant pots** with **moist potting soil**.
2. Plant **radish seeds** in one pot, following the spacing instructions on the seed packet. Label this pot *Recommended Spacing*.
3. Plant **radish seeds** in the second pot, spaced half the recommended distance apart. Label this pot *Densely Populated*. Wash your hands.
4. Keep the soil moist. When the seeds sprout, move them to a well-lit area.
5. Measure the height of the seedlings every two days for two weeks. Record the data below.

### Data and Observations

Day	Height of seedlings (cm)
2	
4	
6	
8	
10	
12	
14	

### Analysis

1. Which plants grew faster?

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2. Which plants looked healthiest after two weeks?

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3. How did competition influence the plants?

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# Mini LAB

## Comparing Biotic Potential

### Procedure



1. Remove all the seeds from a **whole fruit**. Do not put fruit or seeds in your mouth.
2. Count the total number of seeds in the fruit. Wash your hands, then record this data below.
3. Compare your seed totals with those of classmates who examined other types of fruit.

### Data and Observations

Student's name	Kind of fruit	Number of seeds

### Analysis

1. Which type of fruit had the most seeds? Which had the fewest seeds?

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2. What is an advantage of producing many seeds?

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Can you think of a possible disadvantage?

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3. To estimate the total number of seeds produced by a tomato plant, what would you need to know?

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# Feeding Habits of Planaria

## Lab Preview

**Directions:** Answer these questions before you begin the Lab.

1. What precautions should be taken when the animal safety symbol is used?  
\_\_\_\_\_
2. Why is the size of the bowl in the experiment important?  
\_\_\_\_\_

*You probably have watched minnows darting about in a stream. It is not as easy to observe organisms that live at the bottom of a stream, beneath rocks, logs, and dead leaves. Countless stream organisms, including insect larvae, worms, and microscopic organisms, live out of your view. One such organism is a type of flatworm called a planarian. In this lab, you will find out about the eating habits of planarians.*

## Real-World Question

What food items do planarians prefer to eat?

### Materials

small bowl	guppies (several)
planarians (several)	pond or stream water
lettuce leaf	magnifying lens
raw liver or meat	

### Goals

- **Observe** the food preference of planarians.
- **Infer** what planarians eat in the wild.

**Safety Precautions** 

### Procedure

1. Fill the bowl with stream water.
2. Place a lettuce leaf, piece of raw liver, and several guppies in the bowl. Add the planarians. Wash your hands.
3. **Observe** what happens inside the bowl for at least 20 minutes. Do not disturb the bowl or its contents. Use a magnifying lens to look at the planarians.
4. **Record** all of your observations on the lines provided in the Data and Observations section.



(continued)

## Data and Observations

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## Conclude and Apply

1. **Name** the food the planarians preferred.

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2. **Infer** what planarians might eat when in their natural environment.

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3. **Describe**, based on your observations during this lab, a planarian's niche in stream ecosystem.

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4. **Predict** where in a stream you might find planarians. Use references to find out whether your prediction is correct.

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## Communicating Your Data

Share your results with other students in your class. Plan an adult-supervised trip with several classmates to a local stream to search for planarians in their native habitat.

**For more help, refer to the Science Skill Handbook.**





## Design Your Own

# Population Growth in Fruit Flies

## Lab Preview

**Directions:** Answer these questions before you begin the Lab.

1. What is the advantage of using a fast-growing organism in a population experiment?  
\_\_\_\_\_
2. What factors might affect the rate of growth of the fruit fly population?  
\_\_\_\_\_

*Populations can grow at an exponential rate only if the environment provides the right amount of food, shelter, air, moisture, heat, living space, and other factors. You probably have seen fruit flies hovering near ripe bananas or other fruit. Fruit flies are fast-growing organisms often raised in science laboratories. The flies are kept in culture tubes and fed a diet of specially prepared food flakes. Can you improve on this standard growing method to achieve faster population growth?*

## Real-World Question

Will a change in one environment factor affect the growth of a fruit fly population?

## Form a Hypothesis

Based on your reading about fruit flies, state a hypothesis about how changing one environmental factor will affect the rate of growth of a fruit fly population.

## Goals

- **Identify** the environmental factors needed by a population of fruit flies.
- **Design** an experiment to investigate how a change in one environmental factor affects in any way the size of a fruit fly population.
- **Observe** and **measure** changes in population size.

## Possible Materials

fruit flies  
standard fruit fly culture kit  
food items (banana, orange peel, or other fruit)  
water  
heating or cooling source  
culture containers  
cloth, plastic, or other tops for culture containers  
magnifying lens

## Safety Precautions



## Test Your Hypothesis

### Make a Plan

1. As a group, decide on one environmental factor to investigate. Agree on a hypothesis about how a change in this factor will affect population growth. Decide how you will test your hypothesis, and identify the experimental results that would support your hypothesis.
2. **List** the steps you will need to take to test your hypothesis. Describe exactly what you will do. List your materials.
3. **Determine** the method you will use to measure changes in the size of your fruit fly populations.
4. On a separate sheet of paper, prepare a data table to record weekly measurements of your fruit fly populations.
5. Read the entire experiment and make sure all of the steps are in a logical order.
6. **Research** the standard method used to raise fruit flies in the laboratory. Use this method as the control in your experiment.
7. **Identify** all constants, variables, and controls in your experiment.



(continued)

**Follow Your Plan**

1. Make sure your teacher approves your plan before you start.
2. Carry out your experiment.
3. **Measure** the growth of your fruit fly populations weekly and record the data in your data table.

**Analyze your Data**

1. **Identify** the constants and the variables in your experiment.

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2. **Compare** changes in the size of your control population with changes in your experimental population. Which population grew faster?

---

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3. **Make and Use Graphs** Using the information in your data table, make a line graph that shows how the sizes of your two fruit fly populations changed over time. Use a different colored pencil for each population's line on the graph.

**Conclude and Apply**

1. **Explain** whether or not the results support your hypothesis.

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2. **Compare** the growth of your control and experimental populations. Did either population reach exponential growth? How do you know?

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**Communicating Your Data**

Compare the results of your experiment with those of other students in your class.  
**For more help, refer to the Science Skill Handbook.**

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## Laboratory Activity

# Communities

The human population of an area is made up of all the people who live there. The community in which people live includes other populations as well, populations that might include squirrels, honey bees, and maple trees. All the populations living together in a certain area make up a community. The producers in a community make the energy-rich molecules that can be used as food. The consumers obtain food by eating other organisms, either living or dead, that contain the energy-rich molecules. All the organisms in a community interact with each other.

## Strategy

You will study a community.

You will identify organisms in the community that are producers or consumers.

## Materials

thermometer

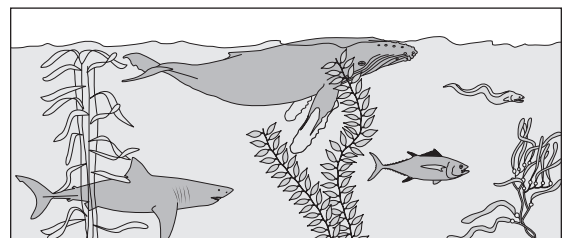
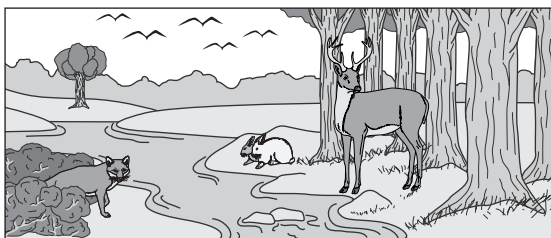
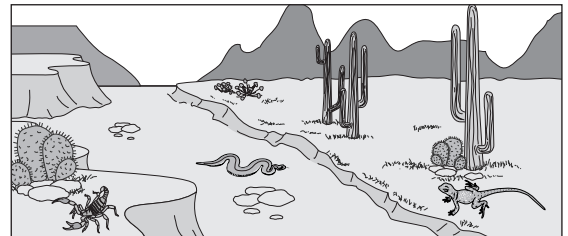
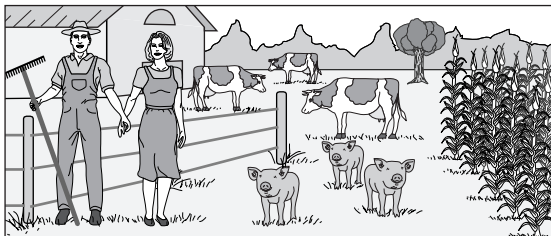
paper

pencil

## Procedure

### Part A

1. In Table 1 in the Data and Observations section, list four living things commonly found in each type of community shown below. For example, a farm community might have humans, cows, horses, chickens, wheat, corn, and soybeans.
2. Classify the living things listed in Table 1 as producers or consumers. Producers can make their own food and are usually green. Consumers cannot make their own food and usually are not green. Circle the producers and underline the consumers.



## Laboratory Activity 1 (continued)

### Part B

1. With your teacher's help, choose a nearby community to study.
2. Record in Table 2 the common names of the consumers and producers that you observed in your selected community. Note the approximate number of each type of organism. Continue your list on a separate sheet of paper, if needed.
3. Moisture, light, season of the year, and temperature can influence communities. Observe these conditions in the community you are studying. Then record your observations below in the Data and Observations section.

### Data and Observations

Table 1

Type of community	Names of organisms
Farm	
Forest	
Desert	
Ocean	

Table 2

Producers		Consumers	
Type	Number	Type	Number
Example: Grass		Example: Mice	

1. Location: \_\_\_\_\_
2. Date of observation: \_\_\_\_\_
3. Amount of direct sunlight: \_\_\_\_\_
4. Evidence of moisture: \_\_\_\_\_
5. Air temperature: \_\_\_\_\_

**Laboratory Activity 1 (continued)****Questions and Conclusions**

1. Define community.

---

2. What is a producer?

---

3. What is a consumer?

---

4. Do all communities have both consumers and producers? Explain.

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5. How many kinds of producers did you find in the community you studied?

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6. How many kinds of consumers did you find?

---

---

7. Did you find more producers than consumers? Explain why there would be more of one than the other.

---

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8. What do producers provide consumers?

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**Strategy Check**

\_\_\_\_\_ Can you study a community?

\_\_\_\_\_ Can you identify the producers and consumers in the community?



**LAB**  
**2** Laboratory  
Activity

## Changes in Predator and Prey Populations

A predator is an animal that kills and eats another animal. A fox is an example of a predator. The prey is the animal killed by a predator. A rabbit is an example of an animal that is prey for the fox.

The sizes of the predator and prey populations can change with time. Biologists sometimes need to know the sizes of certain predator and prey populations. They can sample the population by trapping and/or counting the animals. The result of the samplings changes as the populations change.

### Strategy

You will set up a model of predator and prey populations and observe changes in the results you get from sampling as the populations change.

You will construct a graph showing your results.

### Materials



101 brown beans  
17 white beans  
small paper bag  
colored pencils

### Procedure

#### Part A—Sampling a Population

1. Read this report about animals on the abandoned Linworth farm.  
The Linworth farm was abandoned in 1990, when an interstate highway was built through it. In April 1997, two biologists decided to study how the fox and rabbit populations on the 40 hectares of farmland were changing. The scientists counted rabbits by trapping and releasing them and counted foxes with binoculars. The biologists trapped and released 23 rabbits; they saw 2 foxes. The scientist continued their observations in the spring and fall for several years.
2. Put 92 brown beans and 8 white beans into a bag. The brown beans represent rabbits, and the white beans represent foxes. Note that these numbers are four times the observed number of animals in the example above. The observed animals are the sample. The larger numbers represent the numbers of rabbits and foxes in the actual populations.
3. Shake the bag with the beans. Select a bean without looking. Record your results in Table 1 in the Data and Observations section. If you picked a brown bean, put a mark under “observed” in the rabbit column. If you picked a white bean, put a mark in the fox column.
4. Return the bean to the bag. Select another bean, record the result in Table 1 and return the bean to the bag. Repeat this procedure until you have results recorded for 25 beans, which is 25 percent of the actual numbers in the populations.
5. Add together the numbers of brown beans selected. Record the number in Table 1. Repeat for the white beans.

#### Part B—Recording Changes in Populations

1. Examine Table 2, which explains how to change numbers of beans to show how the rabbit and fox populations changed as a result of changes in environmental factors.

## Laboratory Activity 2 (continued)

2. Use the information in Table 2 and the method described in Part A to sample the populations of rabbits and foxes nine more times. Enter your data in Table 3.
  - a. Start with the information for the first date in Table 2, October 1997. Add and remove beans as directed to represent the changes described.
  - b. Select 25 more beans, returning them to the bag each time. Make marks in the appropriate columns in Table 3, and fill in the total number of brown beans and white beans selected.
  - c. Repeat this procedure for every date in Table 3. When you come to a date in Table 3 that is not included in Table 2, assume there was no change in the populations. However, conduct a new sampling even though the total populations were unchanged.
3. Fill in the graph on the next page using the data from the population samplings that you recorded in Table 3. Use two different colored columns for each date, one for rabbits and one for foxes.

## Data and Observations

Table 1

Sampling Data				
Date	Rabbits (brown beans)		Foxes (white beans)	
	Observed	Total	Observed	Total
April 1997				

Table 2

Changes in Population		
Sampling date	Rabbit population	Fox population
October 1997	The winter was harsh, and food was inadequate. Many rabbits died. Remove 10 brown beans.	Foxes ate pheasants as well as rabbits. Fox numbers increased. Add 2 white beans.
October 1998	Food was plentiful. Rabbits moved into the area. Add 15 brown beans.	Foxes had larger litters than usual. Add 2 white beans.
April 1999	Disease killed many rabbits. Remove 8 brown beans.	Food supply was low due to disease among the rabbits. Some foxes left the area. Remove 3 white beans.
October 1999	Spring came early. Rabbits could breed earlier. Add 12 brown beans.	Food was plentiful. Foxes moved into the area. Add 8 white beans.
April 2000	No change in population.	Inadequate food to feed the increased fox population. Some foxes moved out. Remove 4 white beans.
October 2000	The farm was opened to hunters, who killed pheasants. Foxes ate more rabbits. Remove 14 brown beans.	Hunters shot some foxes. Remove 2 white beans.

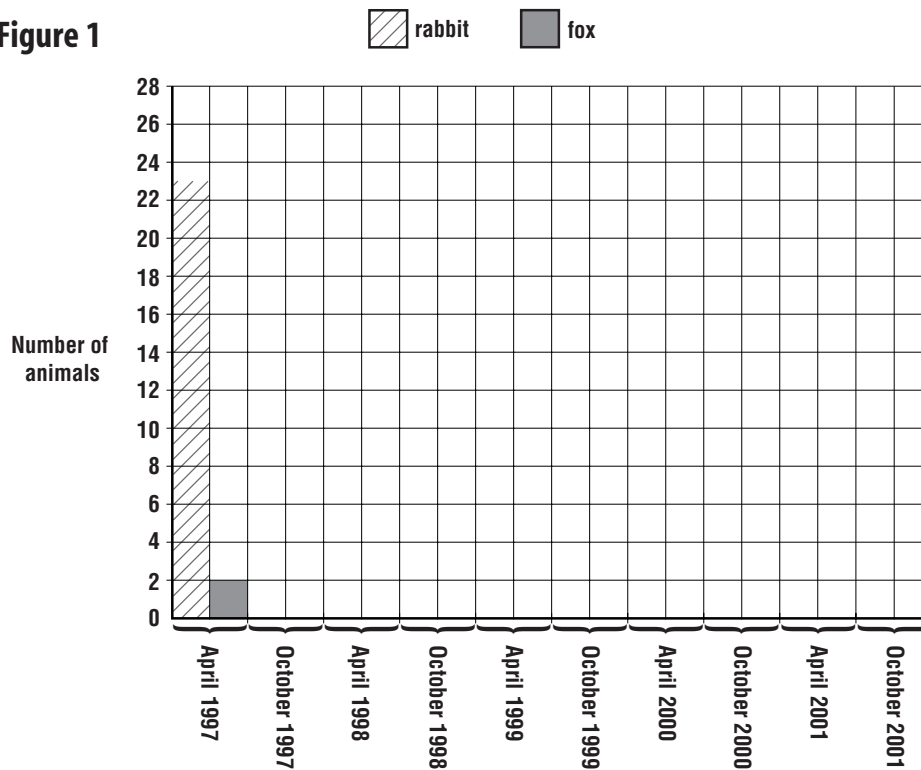


## Laboratory Activity 2 (continued)

**Table 3**

Population Sampling				
Date	Rabbits (brown beans)		Foxes (white beans)	
	Observed	Total	Observed	Total
October 1997				
April 1998				
October 1998				
April 1999				
October 1999				
April 2000				
October 2000				
April 2001				
October 2001				

**Figure 1**

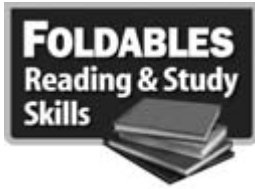


**Laboratory Activity 2 (continued)****Questions and Conclusions**

1. In this example, which animal is the predator and which is the prey?  
\_\_\_\_\_
2. How did the data from your sampling in Part A compare with those of the two biologists in April 1997?  
\_\_\_\_\_  
\_\_\_\_\_
3. Give two factors that caused a decrease in the rabbit population.  
\_\_\_\_\_
4. Give two factors that caused an increase in the rabbit population.  
\_\_\_\_\_  
\_\_\_\_\_
5. Give three factors that caused a decrease in the fox population.  
\_\_\_\_\_  
\_\_\_\_\_
6. Give three factors that caused an increase in the fox population.  
\_\_\_\_\_  
\_\_\_\_\_
7. What happened to the rabbits when the pheasant population decreased?  
\_\_\_\_\_  
\_\_\_\_\_

**Strategy Check**

- \_\_\_\_\_ Can you sample populations without counting each individual?
- \_\_\_\_\_ Can you demonstrate that populations change over time and seasons?



## Interactions of Life

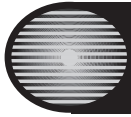
**Directions:** Use this page to label your Foldable at the beginning of the chapter.

# Organism

# Population

# Community

# Meeting Individual Needs



**Directed Reading for  
Content Mastery**

## **Overview Interactions of Life**

**Directions:** Complete the two concept maps using the words listed below.

**population**  
**producers**

**consumers**  
**community**

**decomposers**  
**carnivores**

**biosphere**  
**omnivores**

**herbivores**  
**ecosystem**

The **4.** \_\_\_\_\_ includes the top portion of Earth's crust, all the waters that cover Earth's surface, and the surrounding atmosphere.

An **3.** \_\_\_\_\_ consists of all the communities that live in an area and the nonliving features of their environment.

A **2.** \_\_\_\_\_ consists of all the populations that live in an area.

A **1.** \_\_\_\_\_ consists of all the organisms of one species that live in an area.

All living organisms on Earth are either producers or consumers.

Green plants and other

**5.** \_\_\_\_\_  
use an outside energy  
source to make  
energy-rich  
compounds.

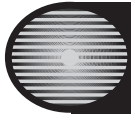
There are four categories of **6.** \_\_\_\_\_, none of which can make their own energy-rich compounds.

**7.** \_\_\_\_\_ eat producers.

**8.** \_\_\_\_\_ eat consumers.

**9.** \_\_\_\_\_ eat producers and consumers.

**10.** \_\_\_\_\_ consume dead organisms.



Directed Reading for  
Content Mastery

**Section 1 ■ Living Earth**  
**Section 2 ■ Populations**

**Directions:** Circle the word listed below in the puzzle. Then complete the sentences by writing the words in the appropriate spaces.

habitat

carrying

limiting

biosphere

population

community

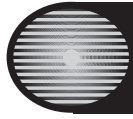
ecologists

size

biotic

A H R X Z A R Y F W P  
C A R R Y I N G Y G A  
D B I O S P H E R E C  
L I M I T I N G I F B  
H T W C S D E Y D S I  
Y A S M G F R E R R O  
J T S N H J T Y T F T  
P O P U L A T I O N I  
U H X E L K S H D F C  
C O M M U N I T Y E C  
Y W F R P C Z H U I D  
U U L O T Y E H U G H  
E C O L O G I S T S E

1. The part of Earth that supports life is called the \_\_\_\_\_.
2. \_\_\_\_\_ are scientists who study the interactions of organisms and their environments.
3. All the people living in one area make up that area's \_\_\_\_\_.
4. All the animals and plants living in an area make up a \_\_\_\_\_.
5. The desert is a tarantula's \_\_\_\_\_.
6. Competition limits a population's \_\_\_\_\_.
7. Anything that restricts the number of individuals in a population is a \_\_\_\_\_ factor.
8. \_\_\_\_\_ capacity is the largest number of individuals of one species that an ecosystem can support over time.
9. The highest rate of reproduction for a population is its \_\_\_\_\_ potential.

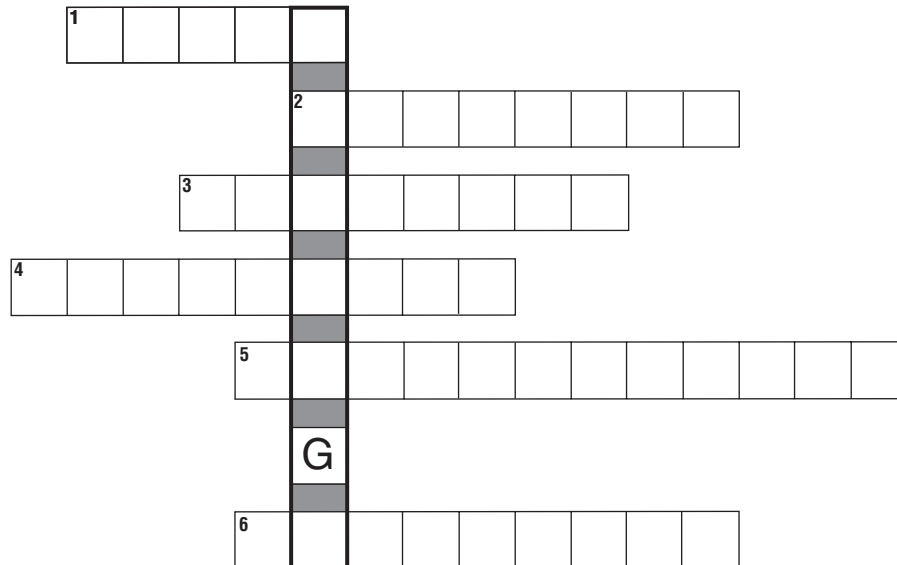


Directed Reading for  
Content Mastery

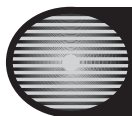
## Section 3 ■ Interactions Within Communities

**Directions:** Write the word that completes each sentence in the correct space in the puzzle. The answers are listed below. The letters in the dark, vertical box spell the answer to question 7.

commensalism                      mutualism  
consumer                      symbiosis                      niche                      producer



1. A \_\_\_\_\_ refers to how an organism survives, including its habitat, how it obtains food and shelter, and how it avoids danger.
2. A \_\_\_\_\_ is an organism that cannot make its own energy-rich molecules.
3. A \_\_\_\_\_ is an organism that uses an outside energy source to make energy-rich molecules.
4. A symbiotic relationship in which both species benefit is called \_\_\_\_\_.
5. \_\_\_\_\_ is a symbiotic relationship in which one organism benefits and the other is not affected.
6. \_\_\_\_\_ is any close relationship between species.
7. \_\_\_\_\_ is the study of interactions among organisms and their environment.



Directed Reading for  
Content Mastery

## Key Terms

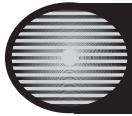
### Interactions of Life

**Directions:** Select the term from the following list that matches each description.

<b>biosphere</b>	<b>carrying capacity</b>	<b>commensalism</b>	<b>community</b>	<b>consumer</b>
<b>ecology</b>	<b>ecosystem</b>	<b>habitat</b>	<b>limiting factor</b>	<b>niche</b>
<b>mutualism</b>	<b>parasitism</b>	<b>population</b>	<b>producer</b>	<b>symbiosis</b>

- \_\_\_\_\_ 1. how an organism survives, including its habitat, how it obtains food and shelter, and how it avoids danger
- \_\_\_\_\_ 2. the place in which an organism lives
- \_\_\_\_\_ 3. all the organisms in an ecosystem that belong to the same species
- \_\_\_\_\_ 4. all the populations in an ecosystem
- \_\_\_\_\_ 5. all the organisms living in an area and the nonliving features of their environment
- \_\_\_\_\_ 6. the part of Earth that supports life, including the top portion of Earth's crust, all the waters that cover Earth's surface, and the surrounding atmosphere
- \_\_\_\_\_ 7. anything that restricts the number of individuals in a population
- \_\_\_\_\_ 8. the largest number of individuals of one species that an ecosystem can support over time
- \_\_\_\_\_ 9. the study of interactions that occur among organisms and their environment
- \_\_\_\_\_ 10. organisms that use an outside energy source, such as the Sun, to make energy-rich molecules
- \_\_\_\_\_ 11. organisms that cannot make their own energy-rich molecules
- \_\_\_\_\_ 12. any close relationship between species
- \_\_\_\_\_ 13. a symbiotic relationship in which both species benefit
- \_\_\_\_\_ 14. a symbiotic relationship in which one organism benefits and the other is not affected
- \_\_\_\_\_ 15. a symbiotic relationship in which one organism benefits but the other is harmed





Lectura dirigida para  
Dominio del contenido

## Sinopsis Interacciones de la vida

**Instrucciones:** Completa los dos mapas de conceptos utilizando la siguiente lista de palabras.

población  
productores

consumidores  
comunidad

desintegradores  
carnívoros

biosfera  
omnívoros

herbívoros  
ecosistema

La(El) **4.** \_\_\_\_\_ incluye la parte superior de la corteza terrestre, toda el agua que cubre la superficie de la Tierra y la atmósfera a su alrededor.

Un(a) **3.** \_\_\_\_\_ comprende la interacción entre los organismos vivos, unos con otros y con su ambiente físico no viviente.

Un(a) **2.** \_\_\_\_\_ comprende todas las poblaciones que viven en un área.

Un(a) **1.** \_\_\_\_\_ comprende todos los organismos de una misma especie que viven en un área.

Todos los organismos en la Tierra son productores o consumidores.

Las plantas verdes y otras(os)

**5.** \_\_\_\_\_ utilizan una fuente de energía exterior para producir compuestos ricos en energía.

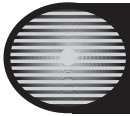
Hay cuatro categorías de **6.** \_\_\_\_\_, ninguno de los cuales puede producir sus propios compuestos ricos en energía.

**7.** \_\_\_\_\_ productores de carne.

**8.** \_\_\_\_\_ come consumidores.

**9.** \_\_\_\_\_ come productores y consumidores.

**10.** \_\_\_\_\_ consume organismos muertos.



Lectura dirigida para  
Dominio del contenido

## Sección 1 ■ Tierra viviente

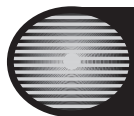
## Sección 2 ■ Poblaciones

**Instrucciones:** Encierra en un círculo cada palabra en la sopa de letra. Completa luego cada oración escribiendo las palabras en los espacios apropiados.

hábitat	de carga	limitante	biosfera	población
comunidad	ecólogos		tamaño	biótico

B I O T I C O E S O N H  
 I J R A N C P C P C A L  
 O V A M A O S O T B I L  
 S D G A S M Z L I B G I  
 F E R Ñ R U N T T J L M  
 E C A O S N A C U E I I  
 R C C S E T A P A C C T  
 A S E M I L E R S O N A  
 D A D I N U M O C L I N  
 O M U N S H S B T O C T  
 F J T S I E S I U G S E  
 P O B L A C I O N O A E  
 O S I O C E G D S S C S

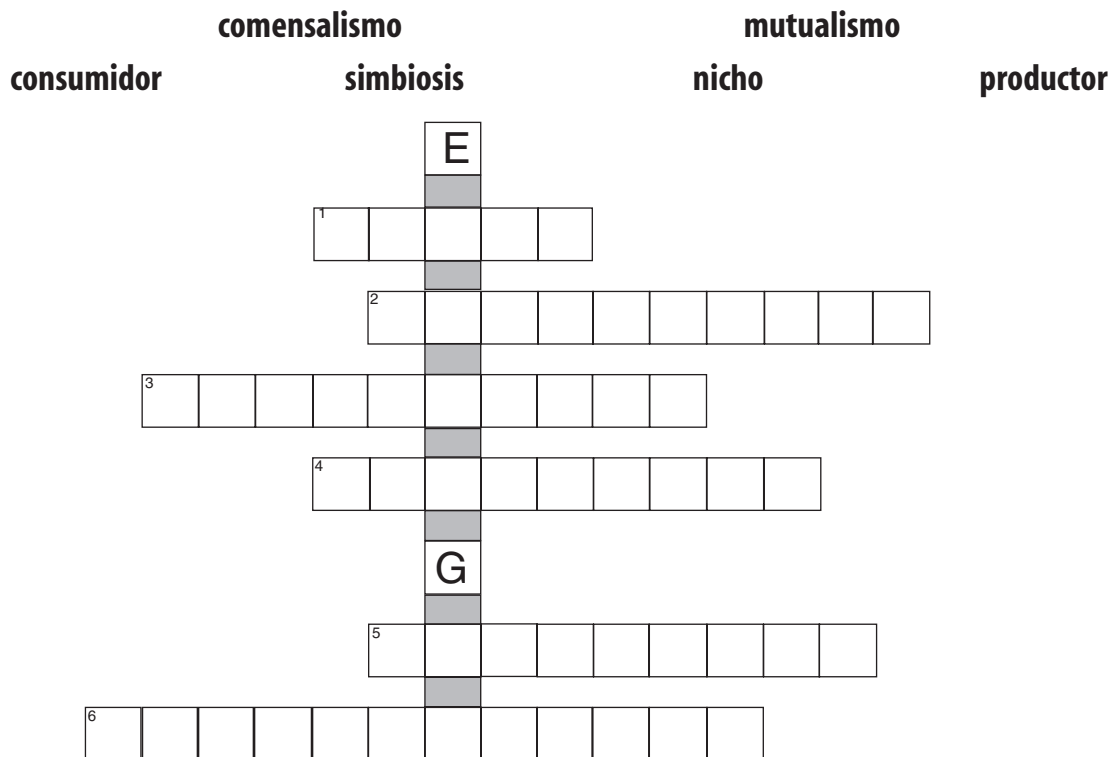
- La parte de la Tierra que sustenta la vida se llama \_\_\_\_\_.
- \_\_\_\_\_ son científicos que estudian las interacciones de los organismos y su ambiente.
- Todas las personas que viven en un área forman el(la) \_\_\_\_\_ de esa área.
- Los animales y plantas que habitan un área forman un(a) \_\_\_\_\_.
- El desierto es el (la) \_\_\_\_\_ de la tarántula.
- La competencia limita el(la) \_\_\_\_\_ de una población.
- Todo lo que restringe el número de individuos en una población es un factor \_\_\_\_\_.
- La capacidad \_\_\_\_\_ es el máximo número de individuos de una especie que un ecosistema puede sustentar a lo largo del tiempo.
- La tasa más alta de reproducción de una población es su potencial \_\_\_\_\_.



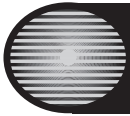
Lectura dirigida para  
Dominio del contenido

## Sección 3 ■ Interacciones entre comunidades

**Instrucciones:** Escribe la palabra que complete cada oración en el espacio asignado del crucigrama. Las respuestas se enumeran abajo. Las letras que aparecen en las cajas oscuras verticales dan la respuesta a la pregunta 7.



1. El \_\_\_\_\_ se refiere a la forma en que un organismo sobrevive, incluyendo su hábitat, cómo obtiene alimento y refugio y cómo evita los peligros.
2. Un(a) \_\_\_\_\_ es un organismo que no puede producir sus propias moléculas ricas en energía.
3. Un(a) \_\_\_\_\_ es un organismo que usa una fuente externa de energía para elaborar sus moléculas ricas en energía.
4. Una relación simbiótica en la cual ambas especies se benefician se llama \_\_\_\_\_.
5. Un(a) \_\_\_\_\_ es una relación simbiótica en la cual un organismo se beneficia y el otro no se ve afectado.
6. Un(a) \_\_\_\_\_ es una relación estrecha entre dos especies.
7. El(La) \_\_\_\_\_ es el estudio de las interacciones entre los organismos y su ambiente.



Lectura dirigida para  
Dominio del contenido

## Palabras claves Interacciones de la vida

**Instrucciones:** *Selecciona el término de la siguiente lista que describe cada oración.*

biosfera	capacidad de carga	comensalismo	comunidad	consumidor
ecología	ecosistema	hábitat	factor limitante	nicho
mutualismo	parasitismo	población	productor	simbiosis

Satisface las necesidades individuales

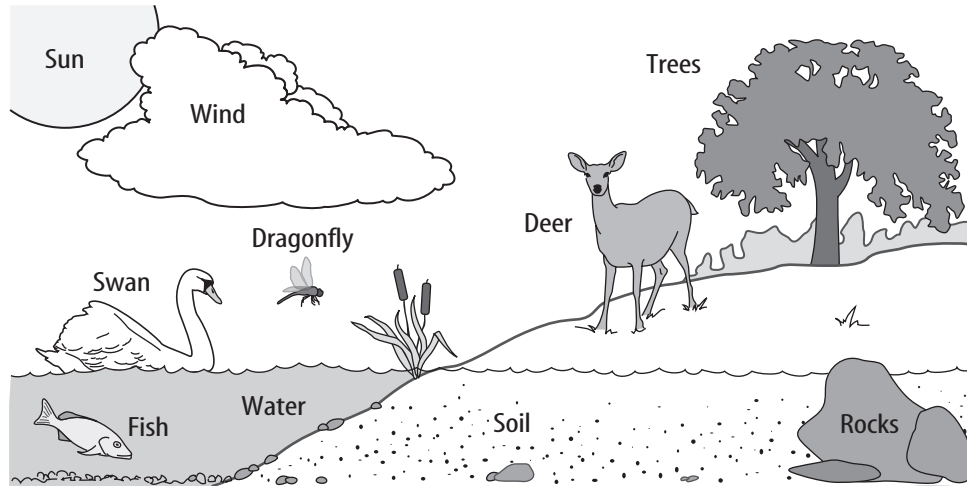
- la forma en que un organismo sobrevive, incluyendo su hábitat, cómo obtiene alimento y refugio y cómo evita los peligros
- el sitio en donde vive un organismo
- todos los organismos de un ecosistema que pertenecen a la misma especie
- todas las poblaciones en un ecosistema
- todos los organismos que viven en un área y los aspectos inanimados de su ambiente
- la parte de la Tierra que sustenta la vida, incluyendo la parte superior de la corteza terrestre, todas las aguas que cubren la Tierra y la atmósfera circundante
- cualquier cosa que restringe el número de individuos de una población
- el máximo número de individuos de una especie que un ecosistema puede sustentar a lo largo del tiempo
- el estudio de las interacciones que ocurren entre los organismos y su ambiente
- aquellos organismos que usan una fuente externa de energía, como el Sol, para elaborar moléculas ricas en energía
- organismos que no pueden elaborar sus propias moléculas ricas en energía
- cualquier relación cercana entre especies
- relación simbiótica en la cual ambas especies se benefician
- relación simbiótica en la cual un organismo se beneficia y el otro no se ve afectado
- relación simbiótica en la cual un organismo se beneficia pero el otro sufre daño

# SECTION 1

## Reinforcement

## Living Earth

**Directions:** Classify the features in the picture as either living organisms or nonliving factors.



1. Living Organisms

2. Nonliving Factors

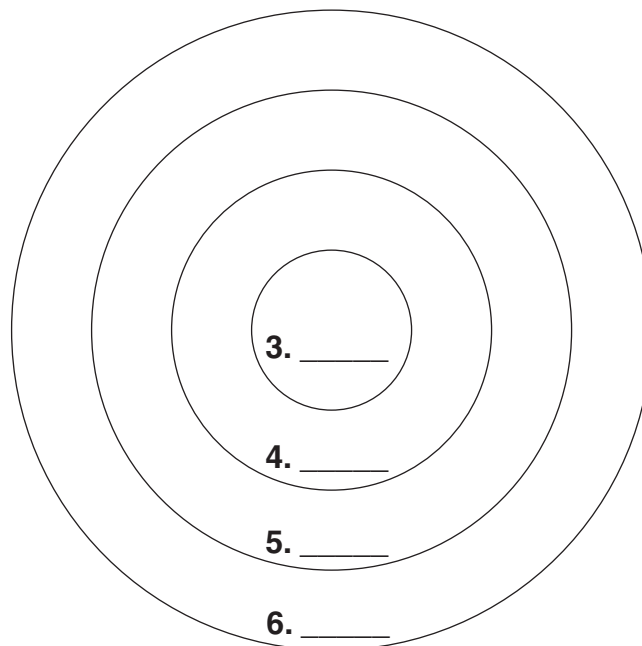
**Directions:** Place the letter of each term below within the circles. The term that includes all of the others should be in the outermost circle. Place the others in order until the smallest group is in the center circle.

a. population

b. ecosystem

c. community

d. organism



**SECTION**  
**2****Reinforcement****Populations**

**Directions:** Answer the following questions on the lines provided.

1. How can competition limit a population's growth?

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2. How can a limiting factor affect a population's growth?

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3. Which has a higher biotic potential, a pumpkin or a peach?

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4. If two squirrels live in one square m of a 50 square m park, what is the park's estimated squirrel population?

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5. What are some factors that might stop a population's exponential growth?

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6. What is carrying capacity?

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7. Give an example of how migration affects population size.

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8. Is it possible for a population with a high birth rate to decrease in size? Explain.

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9. Describe how scientists measure wildlife populations such as rabbits.

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# SECTION 3

## Reinforcement

## Interactions Within Communities

**Directions:** Match the terms in Column II with the definitions in Column I. Write the letter of the correct term in the blank at the left.

### Column I

- \_\_\_\_\_ 1. plant eaters
- \_\_\_\_\_ 2. consume wastes and dead organisms
- \_\_\_\_\_ 3. a consumer captured and eaten by another consumer
- \_\_\_\_\_ 4. use the Sun to make energy-rich molecules
- \_\_\_\_\_ 5. animals that eat other animals
- \_\_\_\_\_ 6. eat plants and other animals
- \_\_\_\_\_ 7. consumers that capture and eat other consumers
- \_\_\_\_\_ 8. cannot make their own energy-rich molecules

### Column II

- a. carnivores
- b. consumers
- c. omnivores
- d. herbivores
- e. predators
- f. producers
- g. decomposers
- h. prey

**Directions:** Select the term from the following list that matches each example.

### commensalism

### mutualism

### parasitism

- \_\_\_\_\_ 9. A clown fish is protected by an anemone's tentacles.
- \_\_\_\_\_ 10. cyanobacteria, or alga, living in the tissues of a fungus
- \_\_\_\_\_ 11. a roundworm that lives in a puppy

**Directions:** Label the examples below either **habitat** or **niche**.

- \_\_\_\_\_ 12. A chameleon changes its colors to blend in with its surroundings.
- \_\_\_\_\_ 13. Ducks and amphibians live in or near a pond.
- \_\_\_\_\_ 14. Birds nest in trees.
- \_\_\_\_\_ 15. A male lion's mane attracts a mate.
- \_\_\_\_\_ 16. Your cat's sense of smell helps it find its way home.
- \_\_\_\_\_ 17. Monarch butterflies eat milkweed, making them poisonous to other species.
- \_\_\_\_\_ 18. Woodpeckers use their beaks to pry insects from trees.

## SECTION

## 1

## Enrichment

# Tropical Rain Forests

There is a climactic region on Earth that covers only 2 percent of its surface yet supports more than half of its plant and animal life. This region is the tropical rain forest. Although different types of rain forests exist in different climates, tropical rain forests receive four to eight meters of rain each year and are located in hot, humid climates near the equator in Africa, South and Central America, and Asia.

## World's Largest Habitat

The world's largest habitat of plant and animal life is the Amazon rain forest in South America. It spreads across 40 percent of the total area of Brazil, covering an area of 6,000,000 square kilometers. Millions of species of plants, insects, birds and other life forms, including jaguars, manatees, red deer, and monkeys, live in this region. Many of the species in the region have never been recorded or studied. Of those plant species that have been documented by scientists, many have proved to be very beneficial to humans.

A significant percentage of modern medicines come from plants that grow in tropical rain forest regions. Rain forests are also important because they recycle water, oxygen, and carbon.

## Shrinking Forest

The humidity, heat, and heavy rainfall of the region create lush vegetation. The trees have broad leaves that form an upper canopy high above the forest floor. Trees that grow in the rain forest include species of myrtle, laurel, palm, rosewood, mahogany, and cedar, to name just a few. Because of the value of mahogany and cedar as lumber, the need for farmland, and the growing population in Brazil, the Amazon rain forest has shrunk drastically in recent decades. Since the 1990s parts of the Amazon rain forest have been protected from further destruction. In other parts of the world, the battle between those who want to protect the rain forest and those who want to exploit its resources continues.

1. Where are tropical rain forests located?

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2. Why do you think rain-forest trees have broad leaves found high above the forest floor?

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3. Do you think rain forests should be protected or should they be used for their resources? Explain.

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4. Why has the Amazon rain forest shrunk in recent years?

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**SECTION**  
**2****Enrichment**

# Tracking Animals for Research

Many animals migrate throughout their lives in search of food, mates, and suitable climates. When animals are constantly on the move, how can researchers possibly keep track of them to learn more about the habits of those creatures? Researchers do this by *tagging*. Tagging involves different types of devices, from bands to darts to electronic transmitters, that allow researchers to learn about animal behavior. First, scientists catch and tag the animals. On the tag they write the date, location, and various biological information. Then they release the animals. At a later date, they must capture the animals again so that the information on the tag can be recorded. Animals that are tagged electronically do not have to be recaptured for researchers to gain information about them. When properly used, tags can tell researchers about where animals travel, what they eat, how long they live, and their birth and death rates.

## Playing Tag

Tags have been used to track many different types of animals, including birds, sharks, sea turtles, and even monarch butterflies. In each case, the tags must be suited to the physical size and activities of the animals. Poorly designed or applied tags can harm animals, or even cause them to die, and can fail to give researchers the information they seek. In the case of birds, leg bands have been used for around 80 years.

For sharks, researchers use tags that vary in size depending on the shark species, but usually involve a dart or similar object that is attached to a cord several inches long. Recently, endangered green sea turtles in the Gulf of Mexico were equipped with satellite transmitters. Researchers there hope to discover information about the migratory movements and other behaviors of the turtles in an effort to prevent them from becoming extinct.

## Stick-on Tags

In working with a more delicate species, Dr. Fred Urquhart spent 20 years developing tags suitable for tracking monarch butterflies, which had disappeared from the Northern United States and Canada. The tags he designed were lightweight adhesive wingtags that are just large enough to carry an identification number and a mailing address to send information. With the help of many volunteers, Dr. Urquhart was able to discern that the monarchs seemed to be heading for Mexico.

Tagging can be dangerous for animals, and proper training is required for each project. Some states have laws that govern or even prohibit certain types of tagging. Those who wish to serve as volunteer taggers for a specific research project should contact the sponsoring research institution for information and training on proper tagging for the particular species and research project.

1. Why do researchers tag animals?

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2. What are some of the different types of tags that are used?

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3. Why might tags be harmful to animals?

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## SECTION

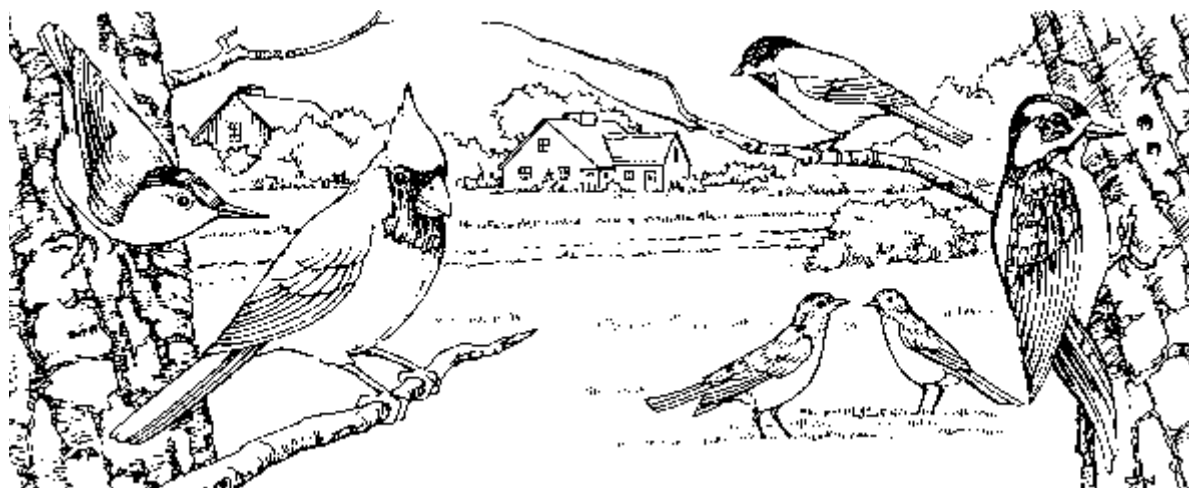
## 3

## Enrichment

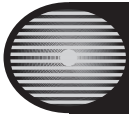
## Interactions Among Living Organisms

Choose two different species of birds you have seen near your home. Your choices will depend on where you live. The birds you choose are a part of the biological community. If you don't know the name of the birds you have seen, use a field identification guide or ask an adult in your home or neighborhood to help you identify them.

Investigate the birds' niches. Their niches will not be exactly the same, since every species has its own niche. Use your observations to complete the table below. You may find additional information on your birds at the library. A field identification guide or books on the specific birds you chose are good sources.



	Bird 1	Bird 2
Kind (species)		
Food		
Home/nest		
Habits/behavior		
Physical description		



## Note-taking Worksheet

# Interactions of Life

## Section 1 Living Earth

A. **Biosphere**—the part of Earth that supports \_\_\_\_\_

1. The \_\_\_\_\_ portion of Earth's crust, all the waters on Earth's surface, and the surrounding \_\_\_\_\_
2. Made up of different \_\_\_\_\_ that are home to different kinds of organisms

B. **Ecosystem**—all the organisms living in an area and the \_\_\_\_\_ parts of their environment

1. \_\_\_\_\_ is the study of interactions that occur among organisms and their environment.
2. A **population** is made up of all the organisms in an ecosystem that belong to the same \_\_\_\_\_.
3. A **community** is all the \_\_\_\_\_ in an ecosystem.

C. \_\_\_\_\_—the place in which an organism lives

1. Must provide the kinds of food, shelter, temperature, and \_\_\_\_\_ the organism needs to survive
2. Example: \_\_\_\_\_ are the woodpecker's habitat

## Section 2 Populations

A. **Competition**—two or more organisms seek the same \_\_\_\_\_ at the same time

1. Competition for food, living space, or other resources can \_\_\_\_\_ the population's size.
2. Competition is usually most intense between members of \_\_\_\_\_ species.

B. **Population** \_\_\_\_\_—indicates whether a population is healthy and growing

1. Population \_\_\_\_\_—the size of a population that occupies a specific area
2. Two ways to measure the \_\_\_\_\_ of a wildlife population
  - a. \_\_\_\_\_ method
  - b. \_\_\_\_\_ method
3. Elements that affect population size
  - a. \_\_\_\_\_—any living or nonliving feature that restricts the number of individuals in a population
  - b. **Carrying capacity**—the \_\_\_\_\_ number of individuals of one species that an ecosystem can support

**Note-taking Worksheet (continued)**

- c. \_\_\_\_\_ potential—highest rate of reproduction under ideal conditions
- d. \_\_\_\_\_ and \_\_\_\_\_ rates
- e. \_\_\_\_\_ of organisms into or out of an area

C. Exponential growth—the larger a population becomes, the \_\_\_\_\_ it grows

**Section 3 Interactions Within Communities**

A. \_\_\_\_\_—source of energy that fuels most life on Earth

1. **Producers**—organisms that use an outside energy source to make

\_\_\_\_\_

- a. Most producers use the Sun and contain \_\_\_\_\_, a chemical required for photosynthesis.
- b. Some producers, found near volcanic vents on the ocean floor, use inorganic molecules as energy sources for \_\_\_\_\_.

2. **Consumers**—organisms that cannot make their own energy-rich molecules; they obtain energy by \_\_\_\_\_.

- a. Herbivores, such as deer and rabbits, eat \_\_\_\_\_.
- b. Carnivores, such as frogs and lions, eat \_\_\_\_\_.
- c. \_\_\_\_\_, such as pigs and humans, eat both plants and animals.
- d. \_\_\_\_\_, such as earthworms and bacteria, eat dead organisms.

3. **Food chain**—a model that shows the \_\_\_\_\_ among the organisms in an ecosystem

B. **Symbiosis**—any close relationship between \_\_\_\_\_

- 1. \_\_\_\_\_—a symbiotic relationship in which both species benefit
- 2. **Commensalism**—a symbiotic relationship in which one organism \_\_\_\_\_ and the other is \_\_\_\_\_
- 3. **Parasitism**—a symbiotic relationship in which one organism \_\_\_\_\_ and the other is \_\_\_\_\_

**Note-taking Worksheet (continued)**

C. \_\_\_\_\_—an organism's role is its environment, including its habitat and food, and how it avoids danger, finds a mate and cares for its young

1. Predator and prey

a. \_\_\_\_\_—consumer that captures and eats other consumers

b. \_\_\_\_\_—the organism that is captured by the predator

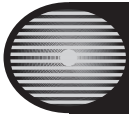
c. Predators limit the size of prey populations, \_\_\_\_\_ the number of different species that can live in an ecosystem

2. \_\_\_\_\_ actions improve a species' survival.

a. Example: one deer warns the others of \_\_\_\_\_ in the area.

b. Example: individual \_\_\_\_\_ perform different tasks required for the survival of all.

# Assessment



## Chapter Review

# Interactions of Life

## Part A. Vocabulary Review

**Directions:** *Unscramble the letters to form the correct term for each definition.*

- |       |                      |   |
|-------|----------------------|---|
| _____ | 1. iglimnti cotraf   | anything that restricts the number of individuals in a population                               |
| _____ | 2. chein             | the ways an organism meets its survival needs   |
| _____ | 3. drouscerp         | organisms that use any outside energy source, such as the Sun, to produce energy-rich molecules |
| _____ | 4. omyntcium         | all the populations in an ecosystem   |
| _____ | 5. cloogey           | the study of interactions that occur among organisms and their environment                      |
| _____ | 6. smuncores         | organisms that cannot make their own energy-rich molecules                                      |
| _____ | 7. rhibosepe         | the part of Earth that supports life  |
| _____ | 8. loonpuapti        | all the organisms in an ecosystem that belong to the same species                               |
| _____ | 9. grycairn acyacipt | the largest number of individuals of one species that an ecosystem can support over time        |
| _____ | 10. emyescost        | all the organisms living in an area and the nonliving features of their environment             |
| _____ | 11. ibatath          | the place in which an organism lives  |

**Directions:** *Complete the following sentences using the terms listed below. Some terms will not be used.*

**symbiosis**

**mutualism**

**commensalism**

**parasitism**

**ecosystem**

**competition**

12. \_\_\_\_\_ refers to any close relationship between species.
13. When one organism benefits and the other organism is not affected, the symbiotic relationship is called \_\_\_\_\_.
14. \_\_\_\_\_ is a symbiotic relationship in which one organism benefits but the other is harmed.
15. A symbiotic relationship in which both organisms benefit is called \_\_\_\_\_.

**Chapter Review (continued)****Part B. Concept Review**

1. List the three things that make up the biosphere.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

2. Briefly compare a termite's habitat and its niche in a forest.

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3. Give an example of each of the following types of relationships.

- a. Predator/prey: \_\_\_\_\_
- b. Mutualistic: \_\_\_\_\_
- c. Parasitic: \_\_\_\_\_
- d. Commensalistic: \_\_\_\_\_

4. Briefly describe the difference between a limiting factor and an ecosystem's carrying capacity.

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5. List four types of consumers.

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_
- d. \_\_\_\_\_

6. Explain the difference between a population and a community.

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7. Using leaves and other vegetation, giraffes, and lions as examples, explain how energy is transferred through a food chain.

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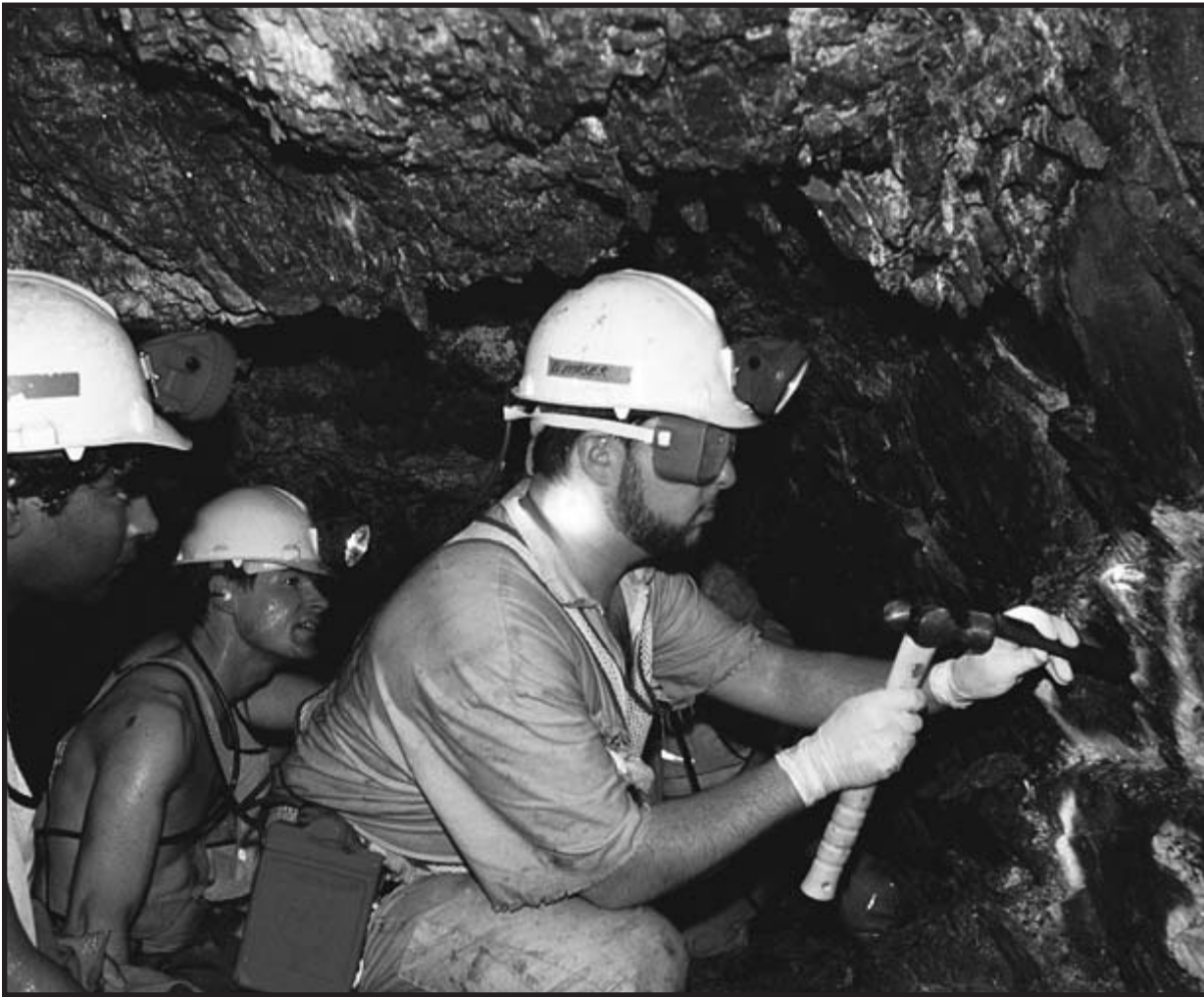


# Transparency Activities

**SECTION**  
**1****Section Focus**  
**Transparency Activity**

## Hot Enough for Ya?

At one time it was thought that no organisms could survive below the soil layer. Over the last twenty years, however, scientists have discovered microorganisms that like hot, high-pressure, and even radioactive conditions! These scientists are working deep in an abandoned gold mine. They are investigating bacteria that thrive in similar harsh conditions.



1. What do you find most surprising about microorganisms living in extreme conditions?
2. Name some other places where living things thrive, but humans cannot.

**SECTION**  
**2****Section Focus**  
**Transparency Activity****That's a Lot  
of Penguins**

Every living thing on Earth has a particular environment that it calls home. These penguins like cold, icy Antarctica. This environment provides the penguins with all of the things they need for survival.

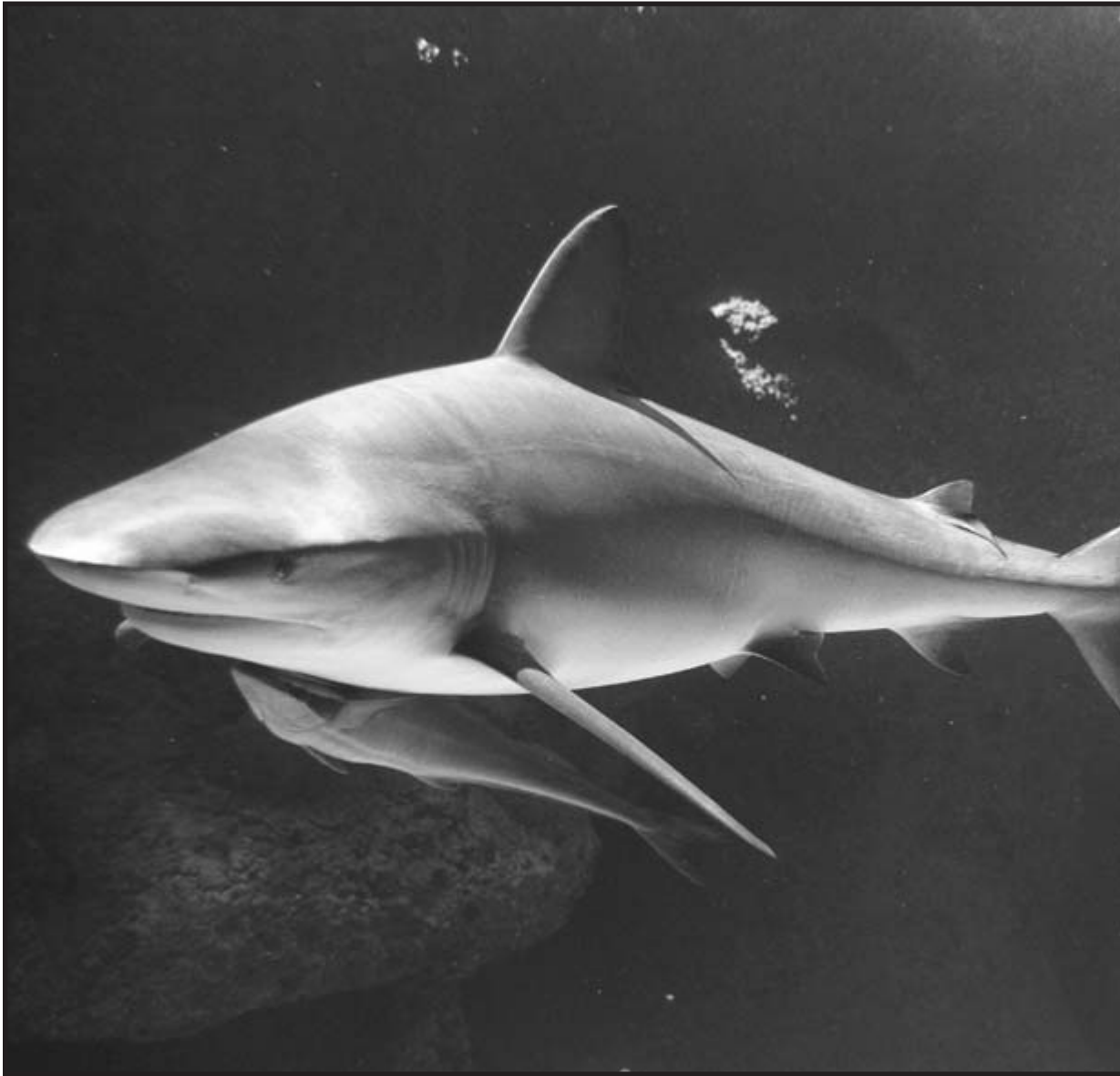


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1. Name some factors that might affect penguin population.
2. How might you estimate the number of penguins in this picture?

**SECTION**  
**3****Section Focus**  
**Transparency Activity****Frolics with Sharks**

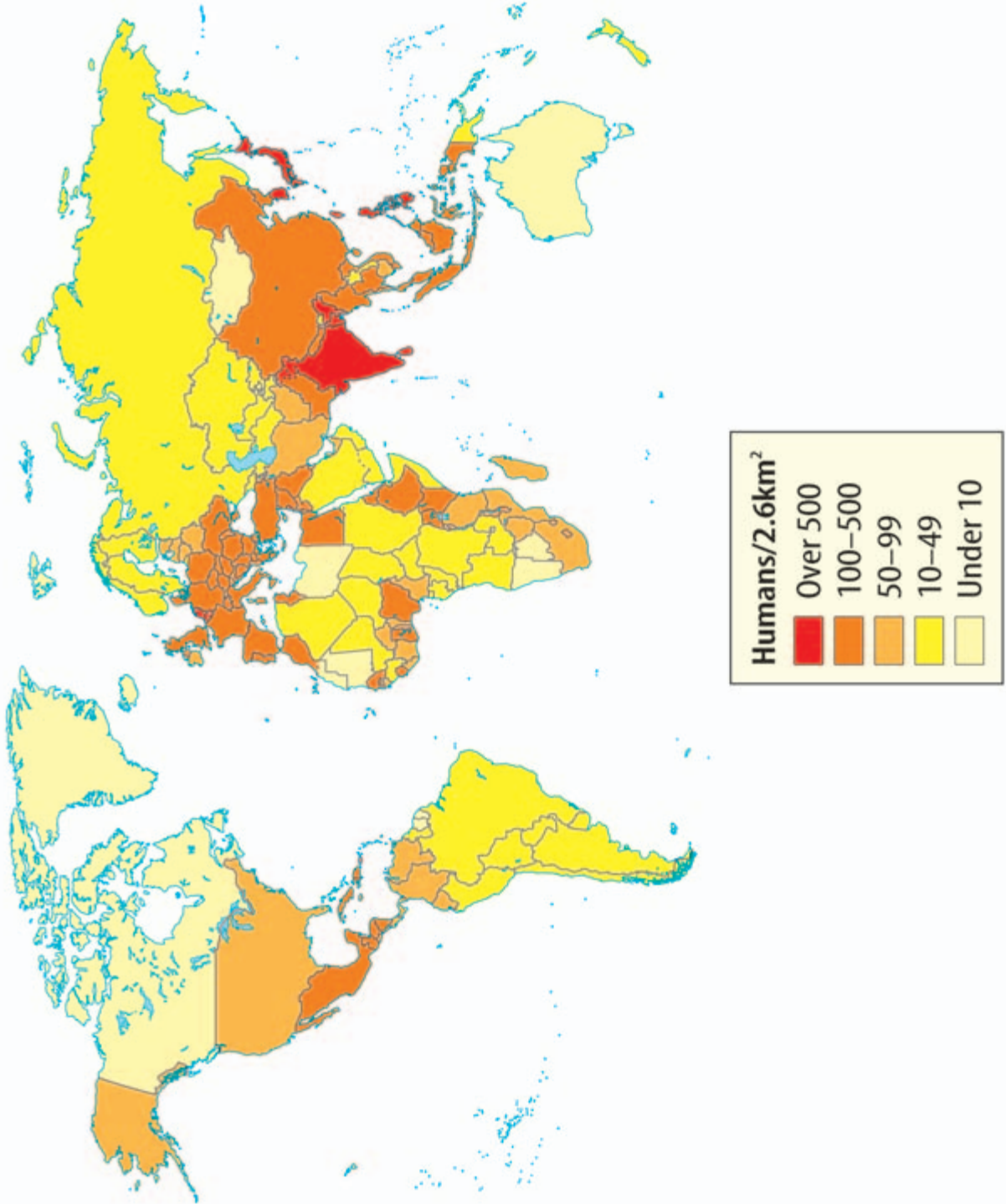
Remoras are several different species of related fishes that attach themselves to sharks and other ocean organisms. Both the shark and the remora benefit from this relationship.



1. Why doesn't the shark eat the remora?
2. How do the shark and remora help each other?

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**SECTION**  
**2****Teaching Transparency**  
**Activity****Population Density**

**Teaching Transparency Activity (continued)**

1. Name five countries that have the highest population densities.

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2. What is the range of humans per 2.6 km<sup>2</sup> in the United States?

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3. Which continent has under ten humans per 2.6 km<sup>2</sup>?

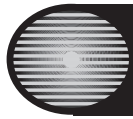
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4. The majority of South America has how many humans per 2.6 km<sup>2</sup>?

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5. What bordering country of the United States has under ten humans per 2.6 km<sup>2</sup>?

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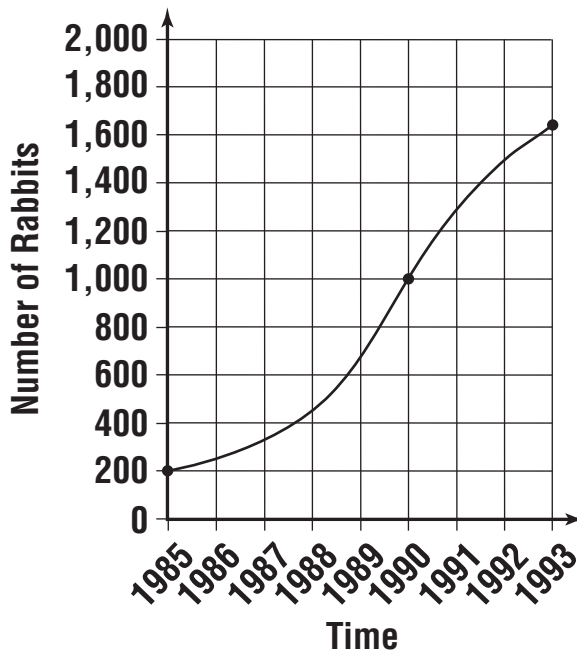


## Assessment Transparency Activity

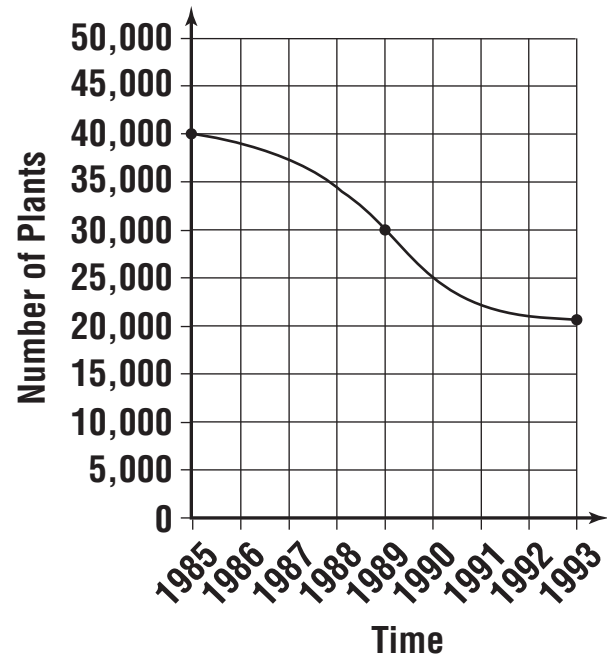
# Interactions of Life

**Directions:** Carefully review the graphs and table and answer the following questions.

**Rabbit Population 1985–1993**



**Plant Population 1985–1993**



- According to these data, which year was the rabbit population increasing most rapidly?  
 A 1985                      B 1986                      C 1990                      D 1993
- A reasonable explanation based on these data is that in 1990 the plant population \_\_\_\_.  
 F was being eaten by the increasing rabbit population  
 G was increasing because the rabbits were disappearing  
 H was being eaten until it was extinct  
 J was not getting enough sunlight
- An herbivore is an animal that only eats plants. A reasonable explanation based on these data is that if an herbivore population increases, then the \_\_\_\_.  
 A decomposer population will decrease  
 B plant population will decrease  
 C carnivore (animal-eater) population will decrease  
 D plant population will increase